



Tales of Fermilab: Cooperation and Competition at the Frontier, 1963-2010

Fifth CERN-Fermilab Hadron Collider Physics Summer School

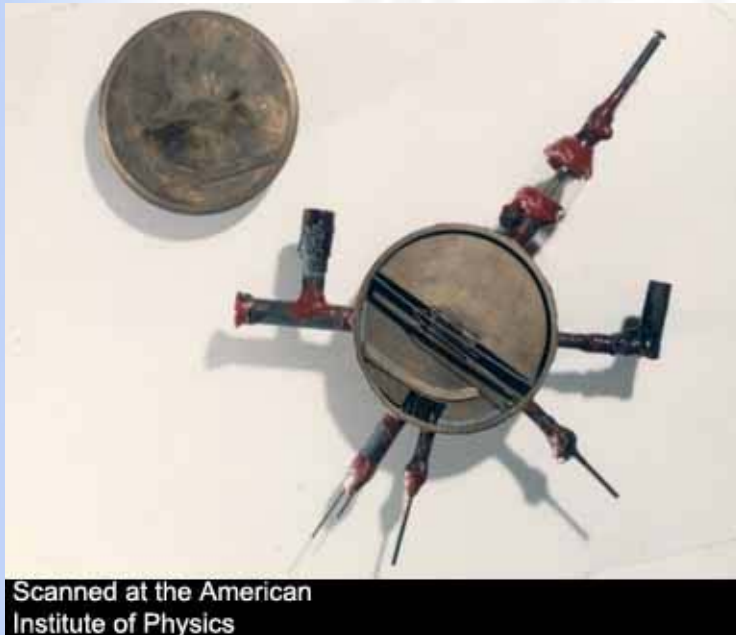
August 17, 2010

Adrienne W. Kolb





The First Accelerators



Scanned at the American
Institute of Physics

Lawrence and Livingston began developing this 4.5-inch cyclotron in 1929-30.



Scan ©American Institute of Physics

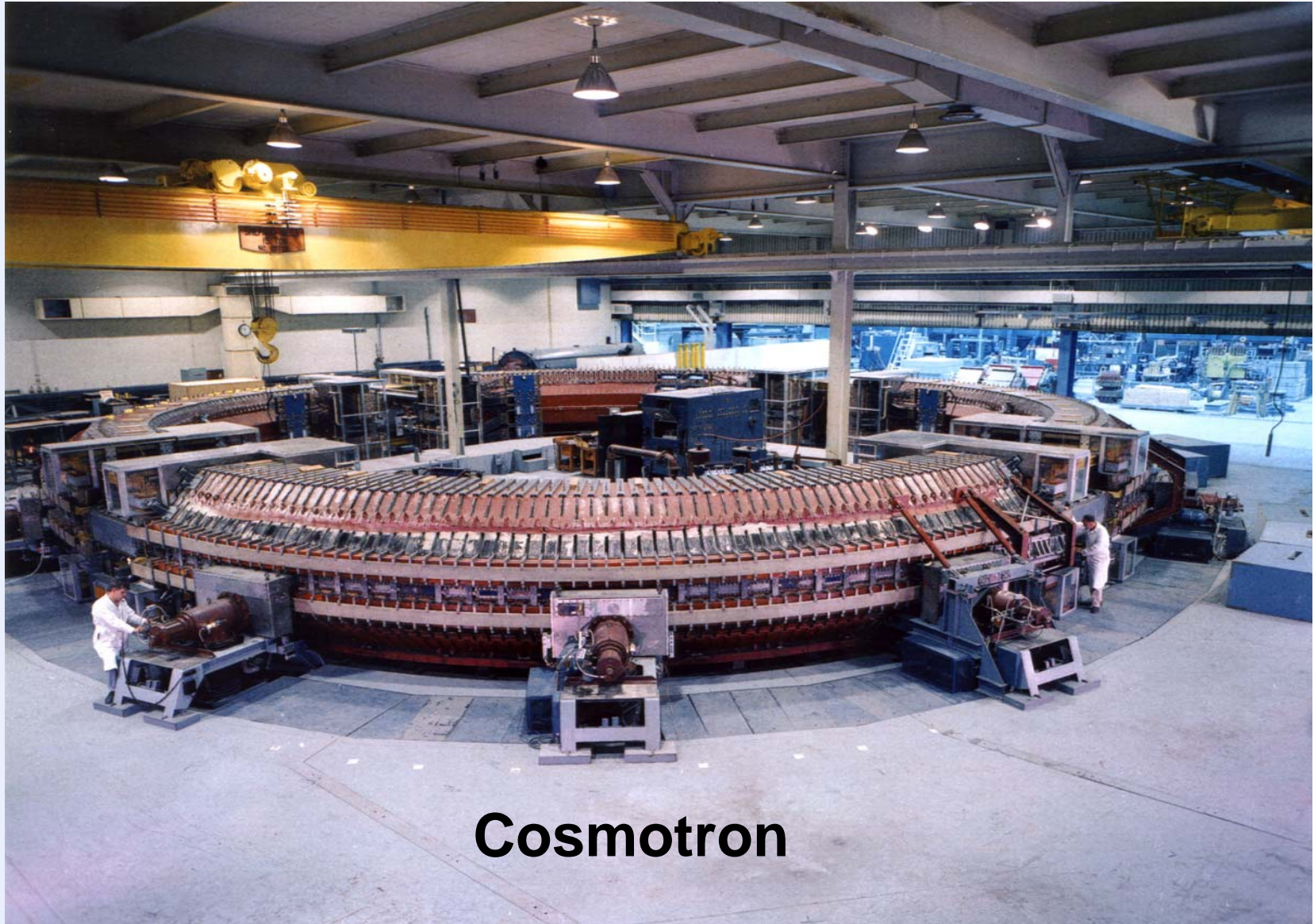
Livingston (left) and Lawrence with the magnet of the 27-inch cyclotron, operating in 1932 at 3.6 MeV.

Berkeley, 1939





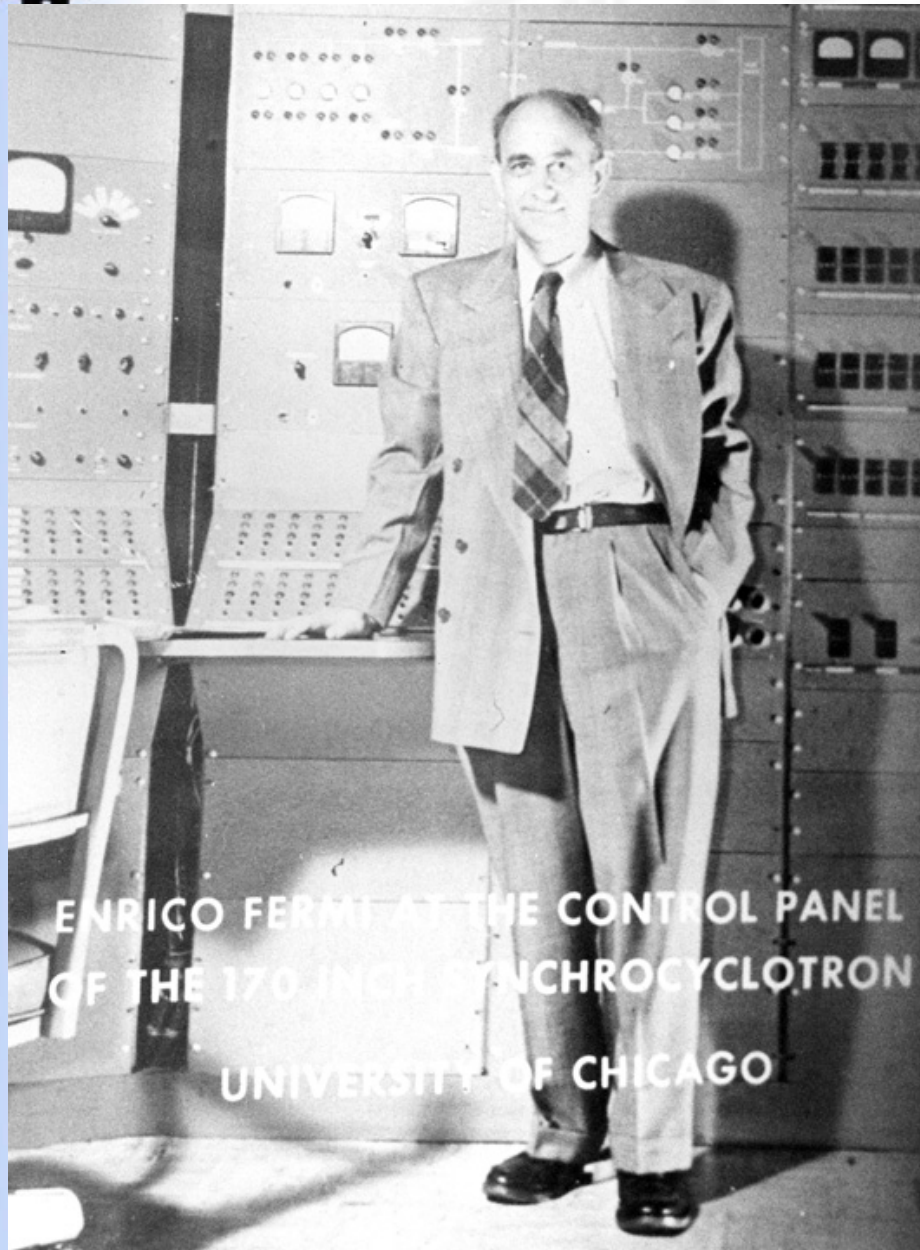
Brookhaven



Cosmotron

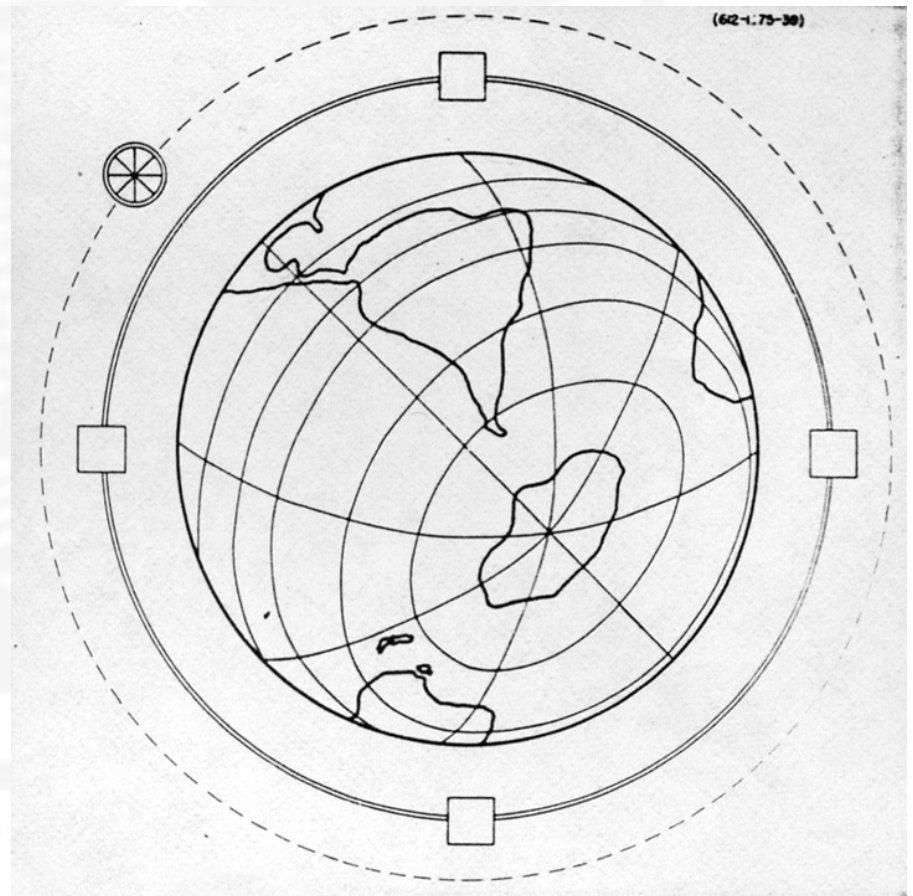
CERN





ENRICO FERMI AT THE CONTROL PANEL
OF THE 170 INCH SYNCHROCYCLOTRON
UNIVERSITY OF CHICAGO

Enrico Fermi's vision – an Accelerator in Space, 1954





The 1963 Frontier

Berkeley

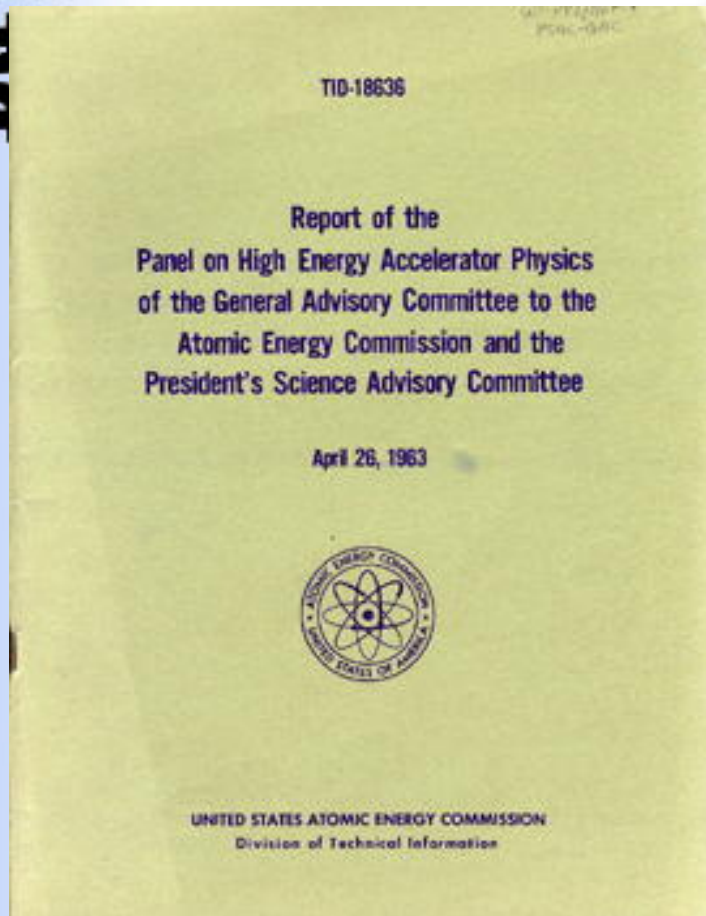
Brookhaven



Bevatron

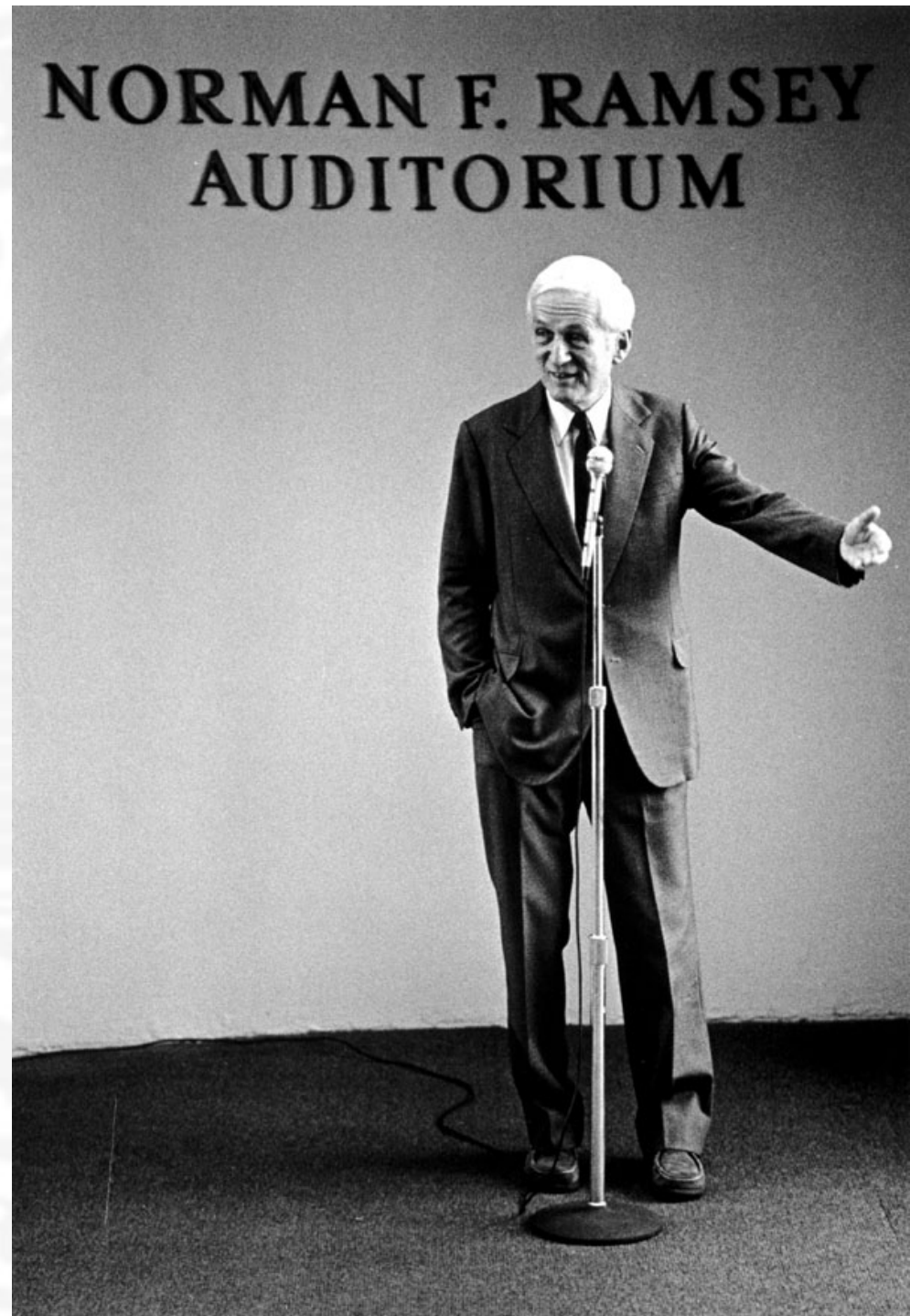


AGS



1963 Ramsey Report

**Dedication of the
Norman F. Ramsey
Auditorium, —→
October 1, 1981**

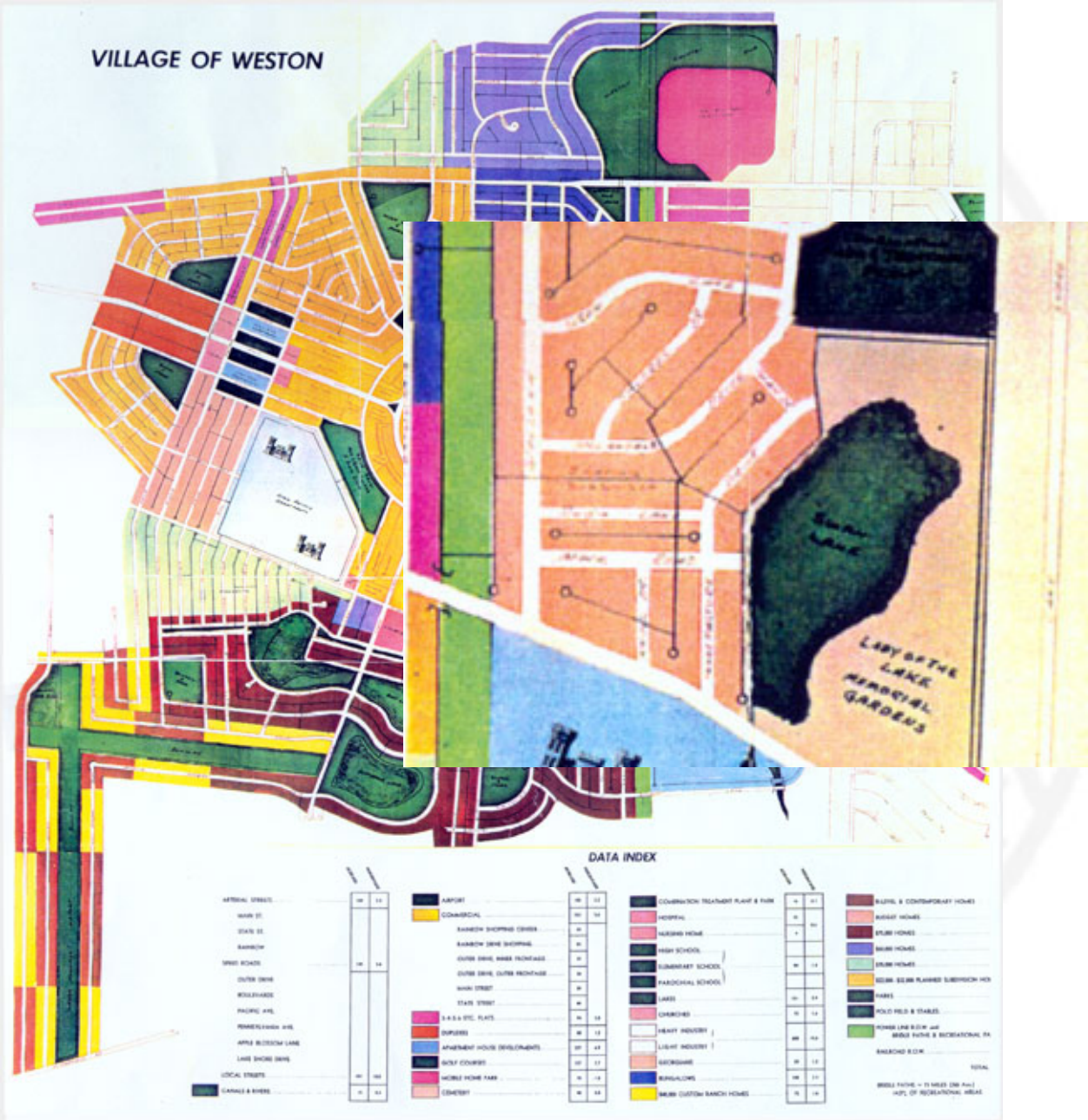


the Illinois Site, 1965





VILLAGE OF WESTON





the Illinois Site, 1965





Fermilab, 1977





A Real Maverick





**Robert R. Wilson,
FNAL Director
1967-1978**





Recruiting Wilson's Corps of Discovery





June 22, 1967

Telegram to:

Dr. Martin Luther King
Southern Christian Leadership Conference
334 Auburn Avenue N. E.
Atlanta, Georgia

with copy to:
Southern Christian Leadership Conference
366 East 47th Street
Chicago, Illinois

We scientists now designing the 200 BeV accelerator to be located at Weston strongly support the struggle for open housing in Illinois. Science has always progressed only through the free contribution of people of all races and creeds. This is no less true today in America, and the full success of this laboratory will depend on achieving conditions in Illinois which will allow any scientist, regardless of race or creed, to participate in this important project - a project which will contribute to a truly great intellectual and cultural heritage in Illinois. We join you in wanting to attain these great ends.

Signed: Robert Rathbun Wilson
Director, National Accelerator
Laboratory



DuPage Shows Little Interest in Protest



AL RABY

7327
DuPage county generally showed little interest last weekend in the first civil rights protest of any proportion to be held here.

The "tent-in" at Warrenville was held to object to location of the atomic energy commission's new research laboratory at Weston without prior adoption of open housing legislation in Illinois. An estimated 250 marchers walked in the rain Saturday from Warrenville to Weston. There were about the same number of spectators.

Sheriff's and state police made two arrests. Fred Catalno, 29, and Christopher Vidmjevich, 23, who gave their addresses as 1314 W. Ohio st., Chicago, will appear July 6 in DuPage county Magistrate's court on charges of littering the highway.

Police said they caught the men, reported to be members of the American Bund party, climbing over a fence after posting and scattering anti-Negro liter-

ature at the camp site on the grounds of the Sisters of the Cenacle retreat house.

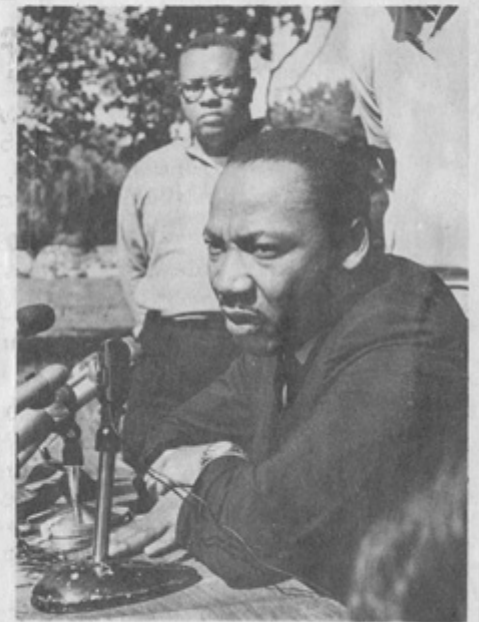
A car bearing a sign "Wallace for President" was diverted from the line of march.

Sheriff Lawrence Springborn assigned 75 uniformed men to the "tent-in" detail. There were 140 uniformed state policemen also on hand.

The Friday night "tent-in" was restricted to 10 campers by agreement between the sisters and the demonstration leaders.

Civil rights leaders the Rev. Martin Luther King and Al Raby both told audiences the federal government had failed to heed its own laws in moving ahead with Weston without fair housing guarantees.

A delegation of protestors was to have flown to Washington Tuesday to continue the Weston protest.

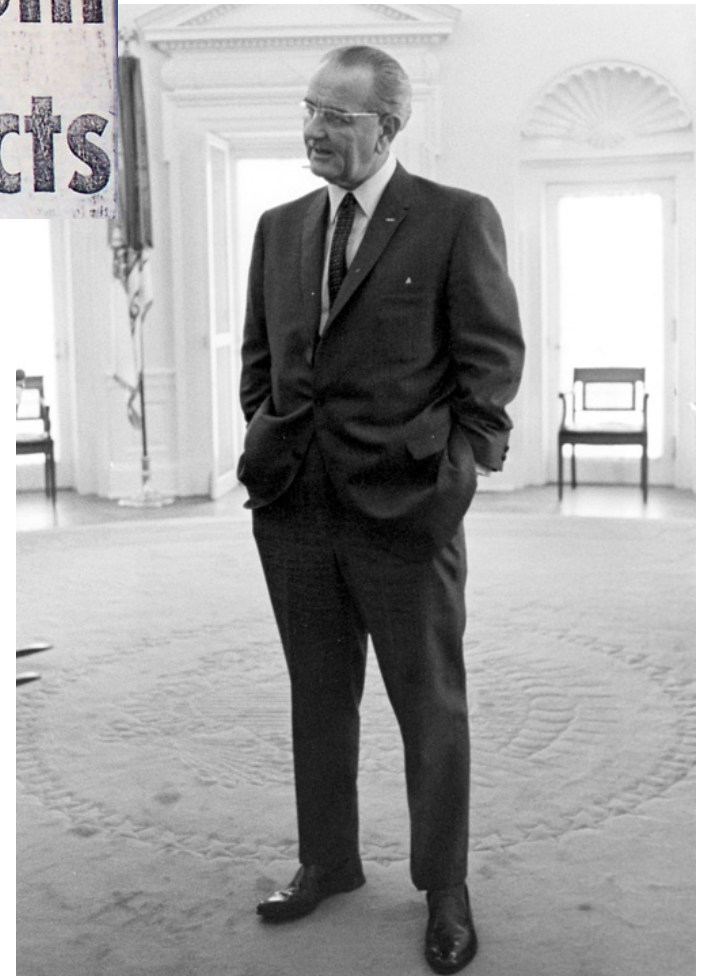


THE REV. MARTIN LUTHER KING

June 23-24, 1967

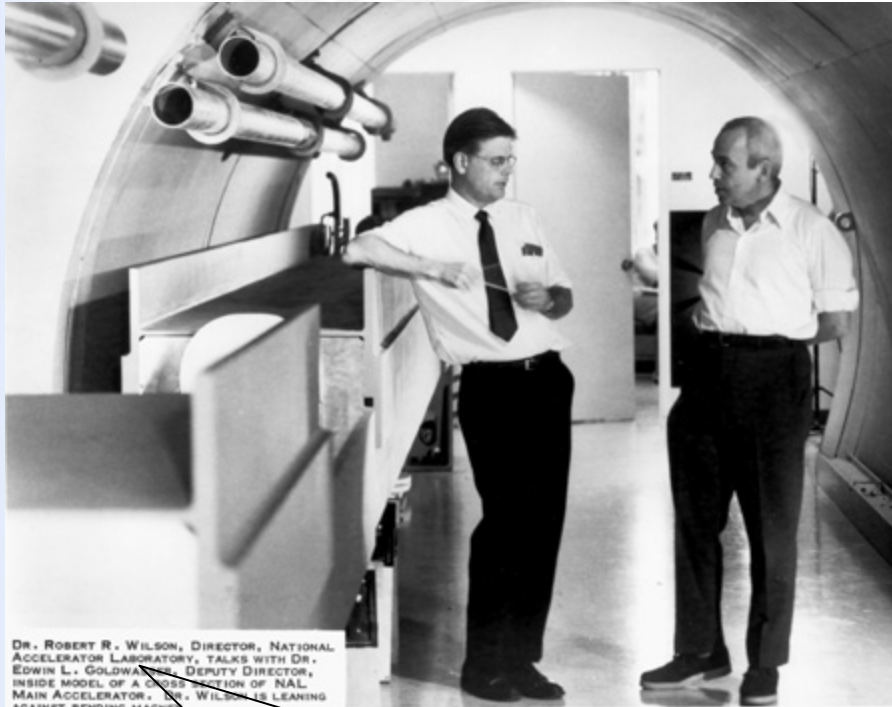


1967 Politics





1968 NAL Human Rights Statement



DR. ROBERT R. WILSON, DIRECTOR, NATIONAL ACCELERATOR LABORATORY, TALKS WITH DR. EDWIN L. GOLDWASSER, DEPUTY DIRECTOR, INSIDE MODEL OF A CROSS SECTION OF NAL MAIN ACCELERATOR. DR. WILSON IS LEANING AGAINST BENDING MAGNET.

DR. ROBERT R. WILSON, DIRECTOR, NATIONAL ACCELERATOR LABORATORY, TALKS WITH DR. EDWIN L. GOLDWASSER, DEPUTY DIRECTOR, INSIDE MODEL OF A CROSS SECTION OF NAL MAIN ACCELERATOR. DR. WILSON IS LEANING AGAINST BENDING MAGNET.

"It will be the policy of the National Accelerator Laboratory to seek the achievement of its scientific goals within a framework of equal employment opportunity and of a deep dedication to the fundamental tenets of human rights and dignity."

**Robert Rathbun Wilson,
Director, and Edwin L.
Goldwasser, Deputy Director**



Aerial view of NAL Village, 1968





**Robert R. Wilson and Glenn Seaborg, AEC Chairman,
at the NAL Groundbreaking, December 1, 1968**



The buffalo herd came to Fermilab from Colorado and Wyoming in September, 1969.





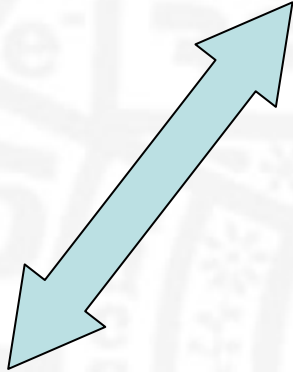
Transferring the Site to Atomic Energy Commission April 1969



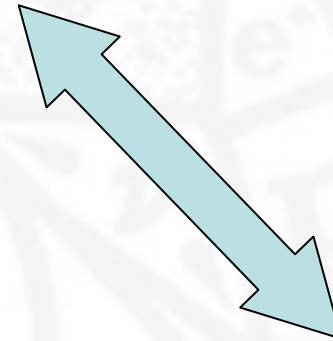
Goldwasser and Ramsey with Governors Shapiro, Ogilvie, and Kerner



**Graduates of
Trinity College
Cambridge**



**Illinois Governors
(went to/going to)
jail**





**Testimony before the
Congressional Joint Committee on Atomic Energy
April 16, 1969**

Dr. Wilson: It only has to do with the respect with which we regard one another, the dignity of men, our love of culture. It has to do with those things. It has to do with, are we good painters, good sculptors, great poets? I mean all the things that we really venerate and honor in our country and are patriotic about. **It has nothing to do directly with defending our country except to help make it worth defending.**



Groundbreaking for the Main Ring, October, 1969



**Installing the
Main Ring, 1970**



The Main Ring, 1972





200 GeV March 1, 1972



Wilson toasts the NAL staff



1971 Users Meeting



A “User’s Paradise”

**NAL experimenters
1972**



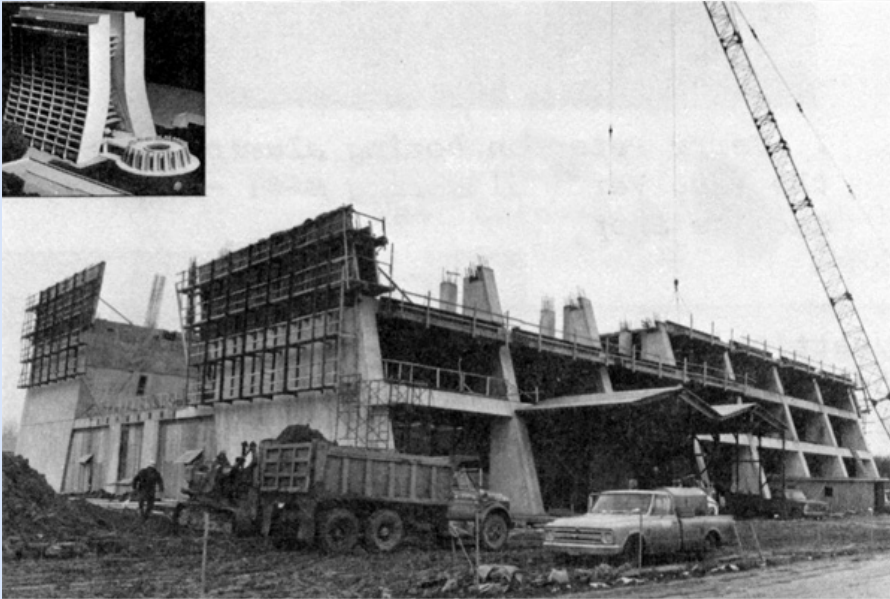


National Accelerator Laboratory, 1972





Construction of Wilson Hall



← January, 1972

February, 1973 →



From Vision to Reality



The “Truly National Laboratory”



Meson Area, 1974





Scanned at the American
Institute of Physics

Neutrino Area, 1974





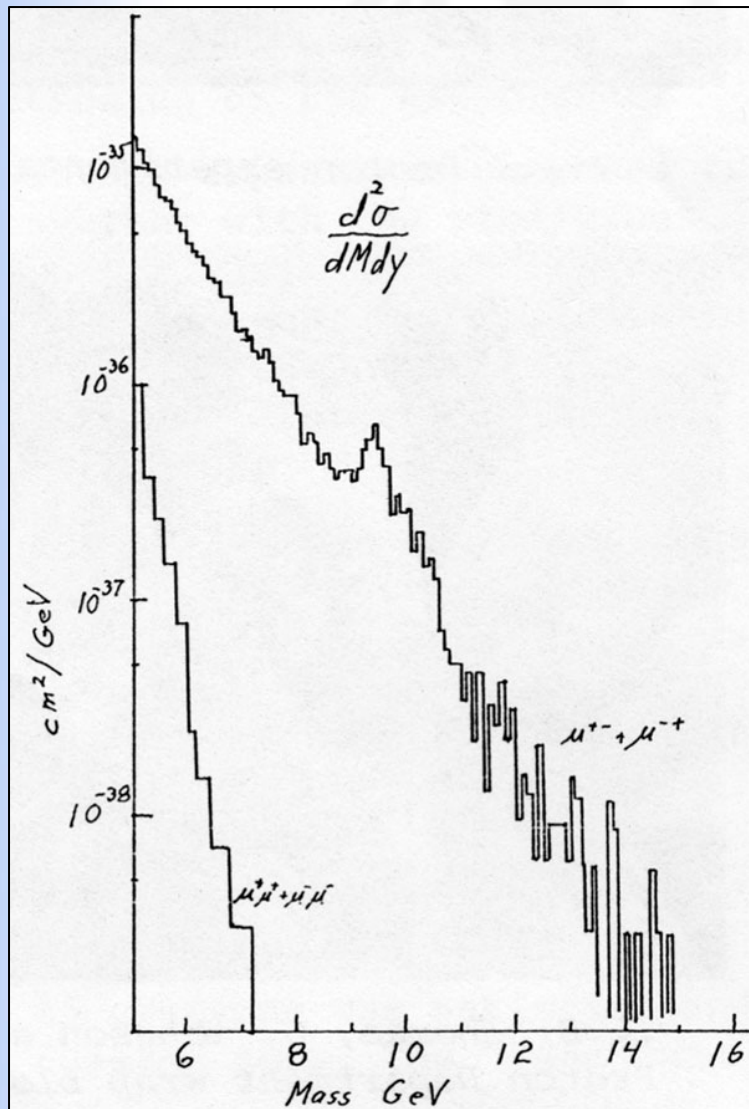
**Proton Area
1975**



Proton Pagoda

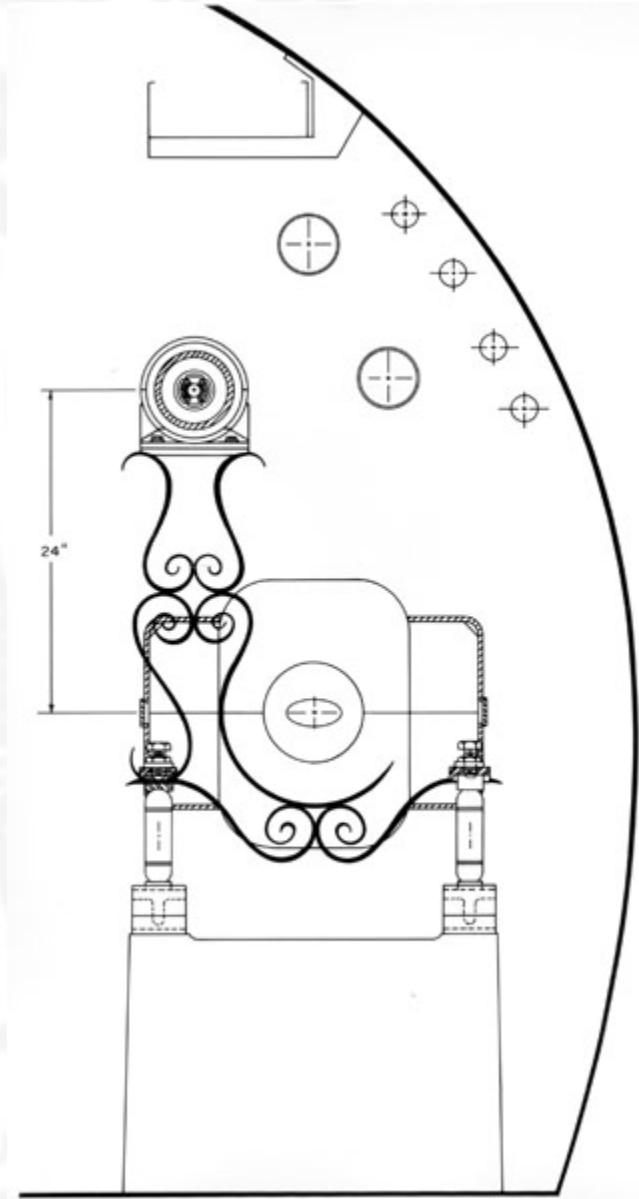
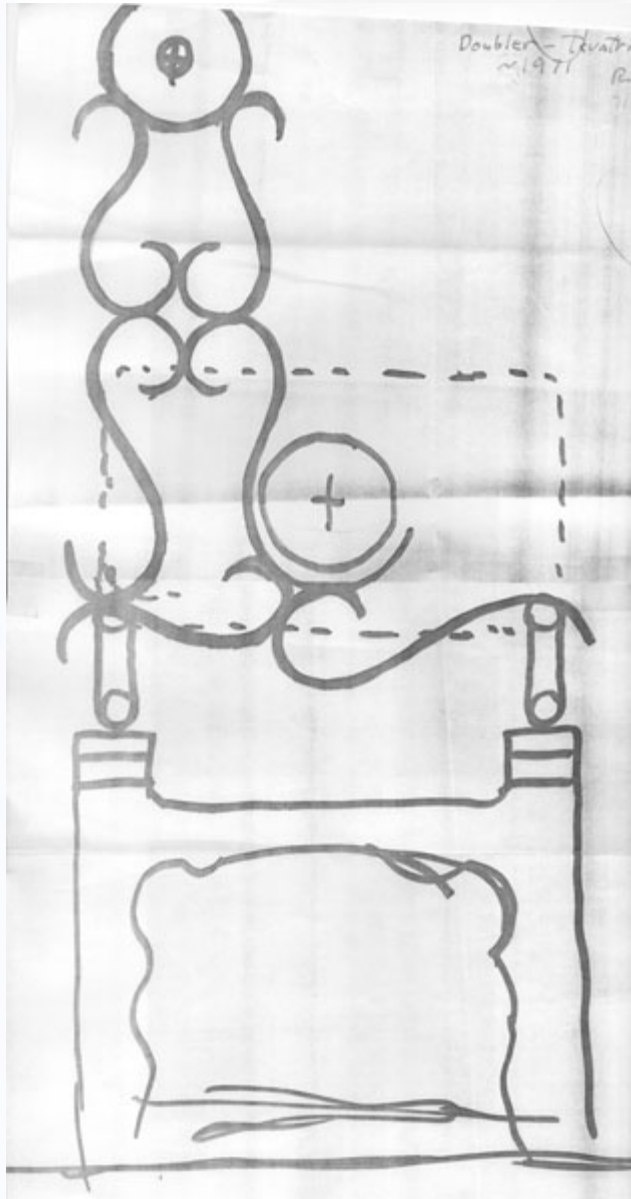


Discovery of Bottom Quark, June 1977



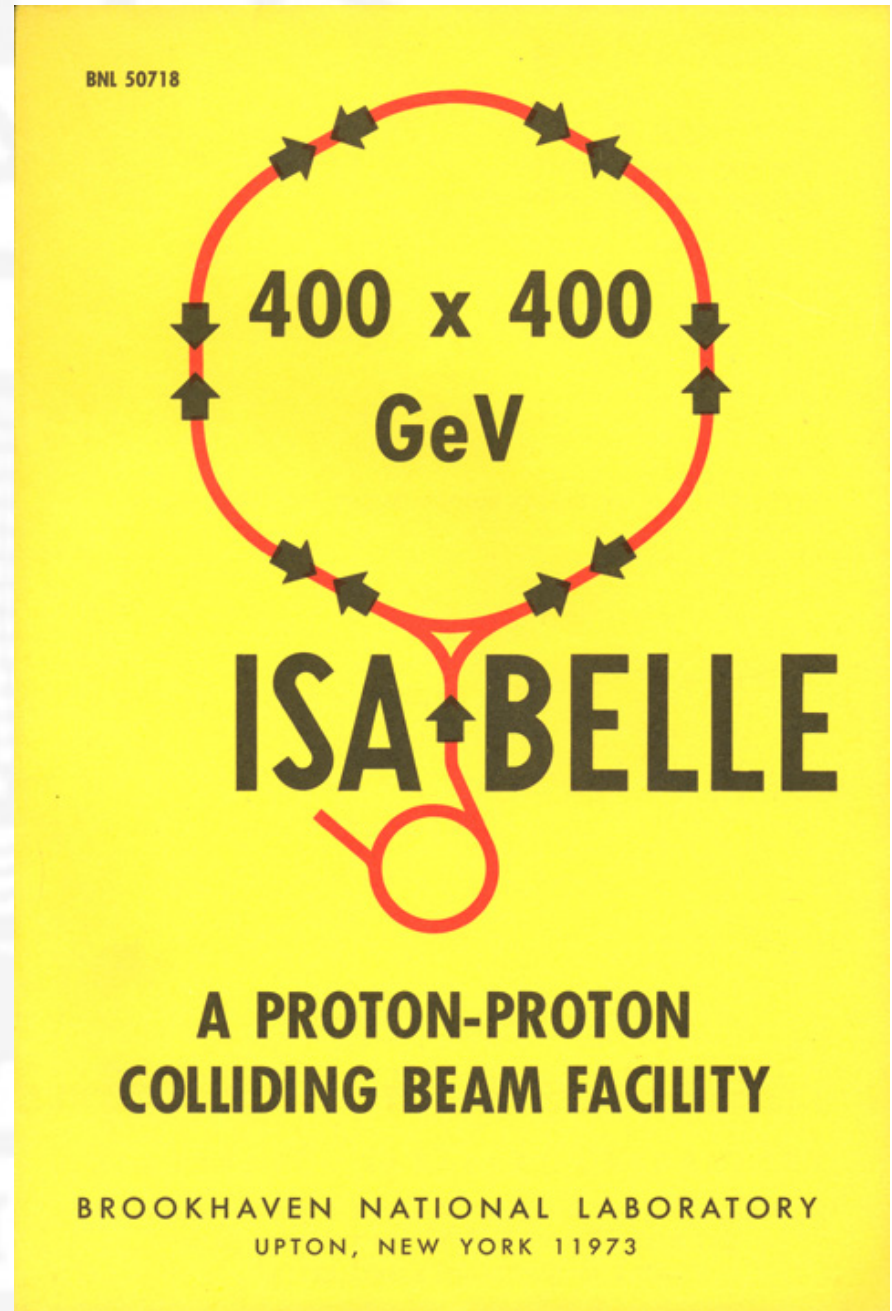


Wilson's vision of the Doubler, 1971





Inter-Laboratory Competition 1975-1983





"Acqua Alle Funi" 1978





**Leon M. Lederman,
Fermilab Director
1978-1989**





ICFA JAN 78

② Workshop on VBA How to do it.

How do we see it "going"
wisdom: let the US group call on
State Dept types to think about...

Chairman Summary

1. Don't need to set up working groups

2. But need workshop

a) VBA $\begin{cases} \text{Inv} \\ \text{PI} \\ \text{H} \end{cases}$

b) Regional Fac
in context

20-40 people - acc
7- dele

• Computers, Etc.

→ meeting in October

The parameters of the region

Defector Session Oct '78

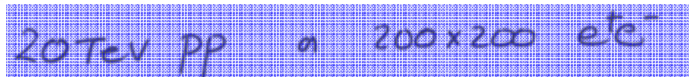
Wachen - Organizer
WHO

magnets

Sociological problems of
International Collaboration

Oct 15 - Mtg
27th ICFA Fri





1. Limitations & Possibilities

Physics
acceleration
~~management~~ / Poti
Managerial / Legal / Economic

Europe: Common Market

D When you know what you want can't see it

2) Treaty - Economic -

⇒ * Experts * Unanimous * not too * International

* Financial *

* *

* * *

*

adams: not heard
International

ICSU

*  *
*  *

1. legal problems involved in drawing up International Agreements for VBA

3. Question of Admissibility of non-active countries

4. Site selection mechanisms

5. DG " " "

1 State dept type Political Science

1 Budgetary type Economist

1 ~~Sci~~ Science Admin

1 ICFA Physicist

13 members



Chez Leon



2001



2003



2004

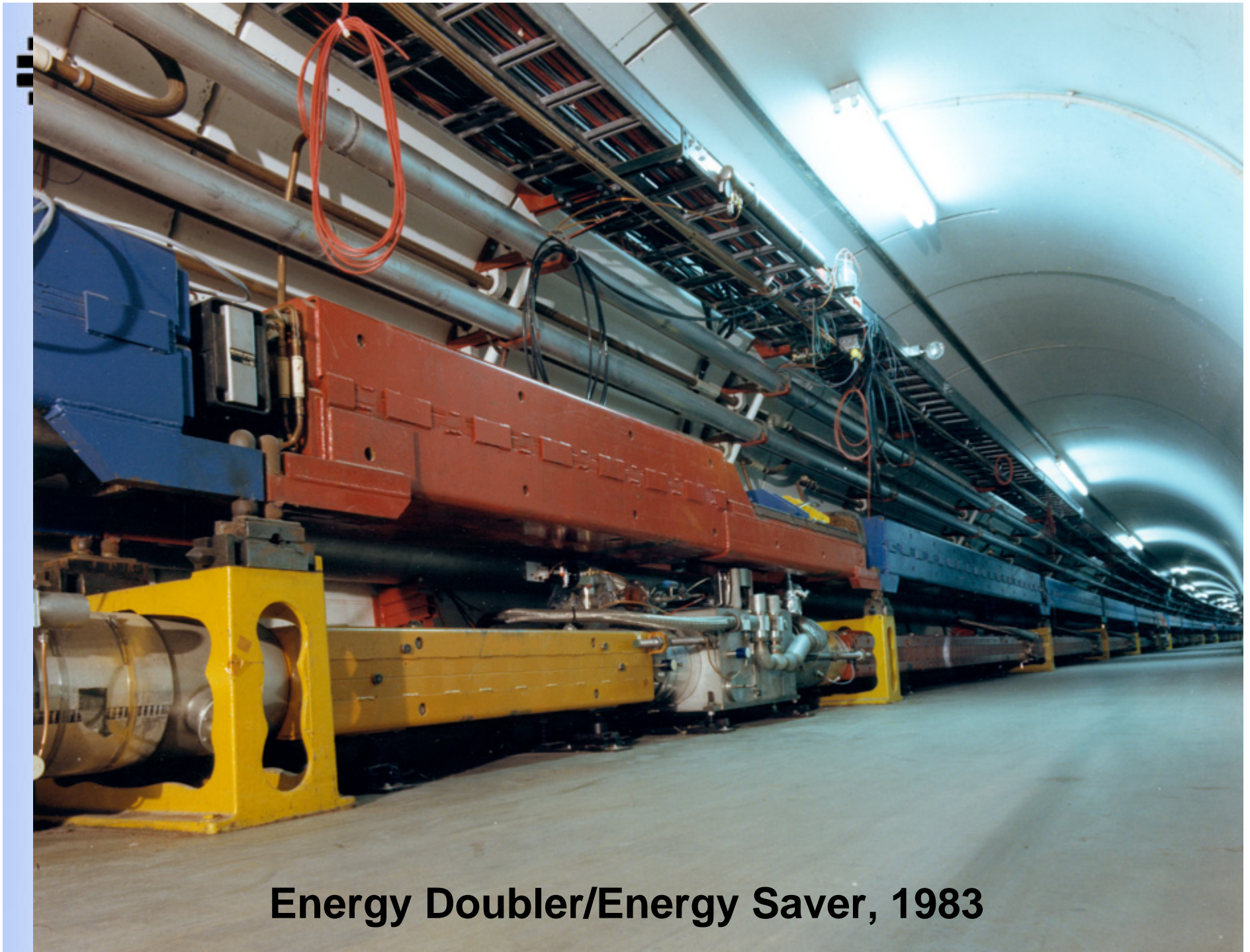


1982



1984

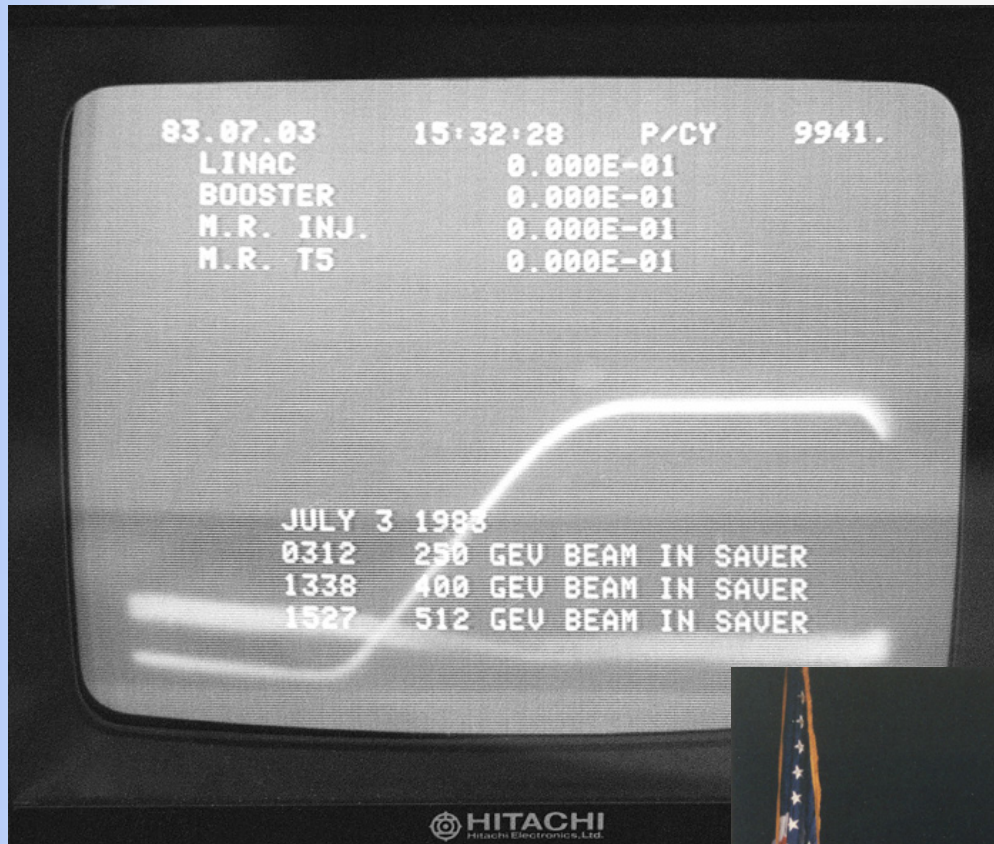
Fermilab Children's Center



Energy Doubler/Energy Saver, 1983



The Energy Saver reached its design goal: accelerating protons to 500 GeV in a ring of superconducting magnets. In fact, the energy was 512 GeV -- a new world record for accelerators. The record was set at 3:37 p.m., Sunday, July 3, 1983, only 13 hours after the first serious attempt to accelerate beam above the injection energy of 150 GeV.



← **Energy Doubler/Saver
512 GeV
July 3, 1983**

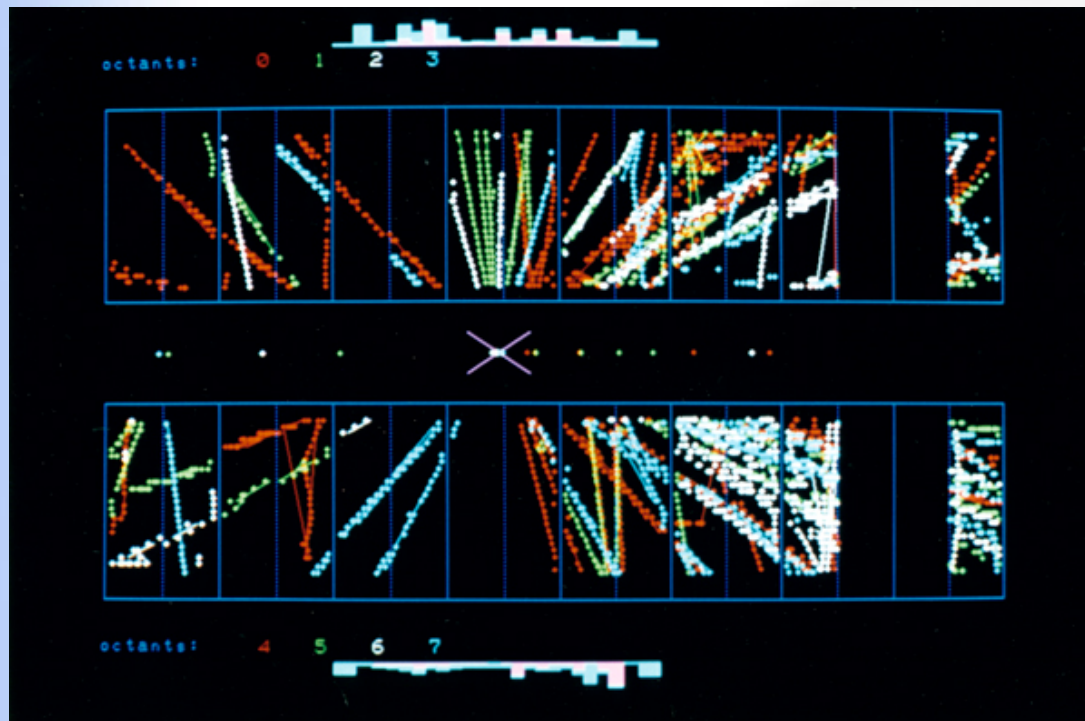
**Dedication of the
Energy Doubler/Saver
April 28, 1984** →





An Antiproton Source for Colliding Beams, 1983





← **First Collisions
October 13, 1985**

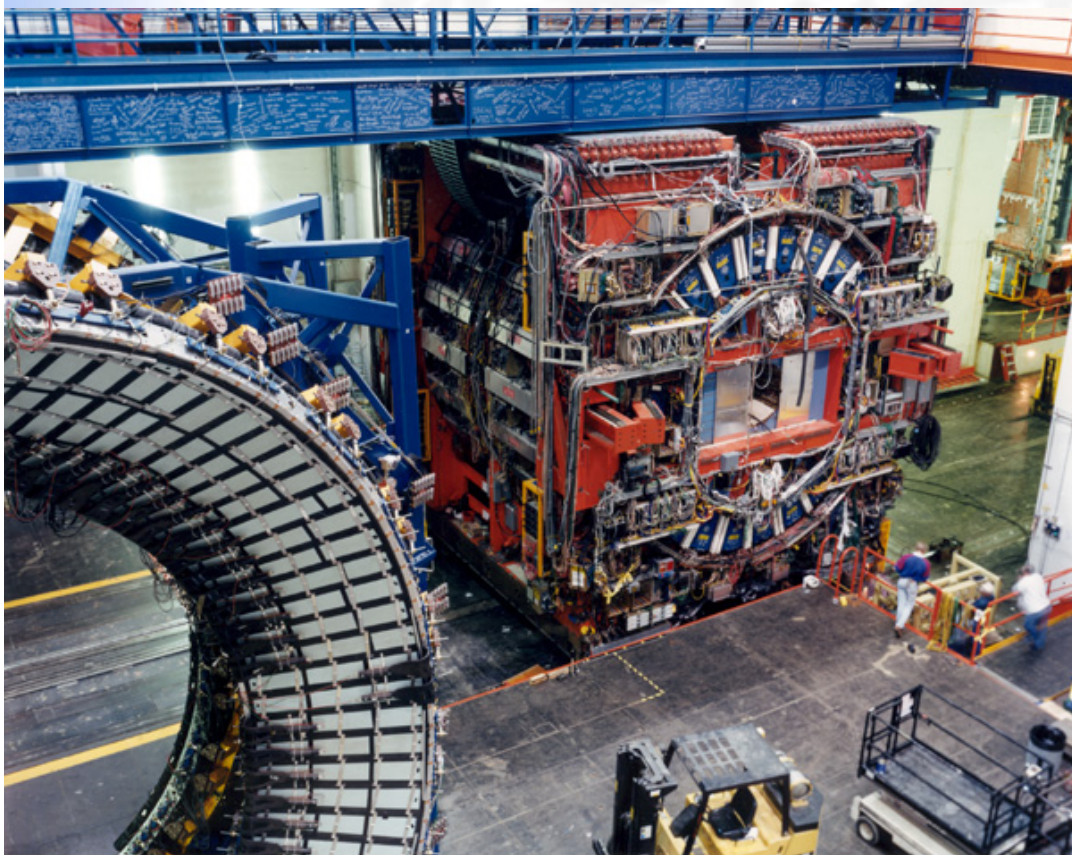
**Dedication of the
Tevatron Collider** →
October 11, 1985





Detectors for Colliding Beams

CDF and DZero

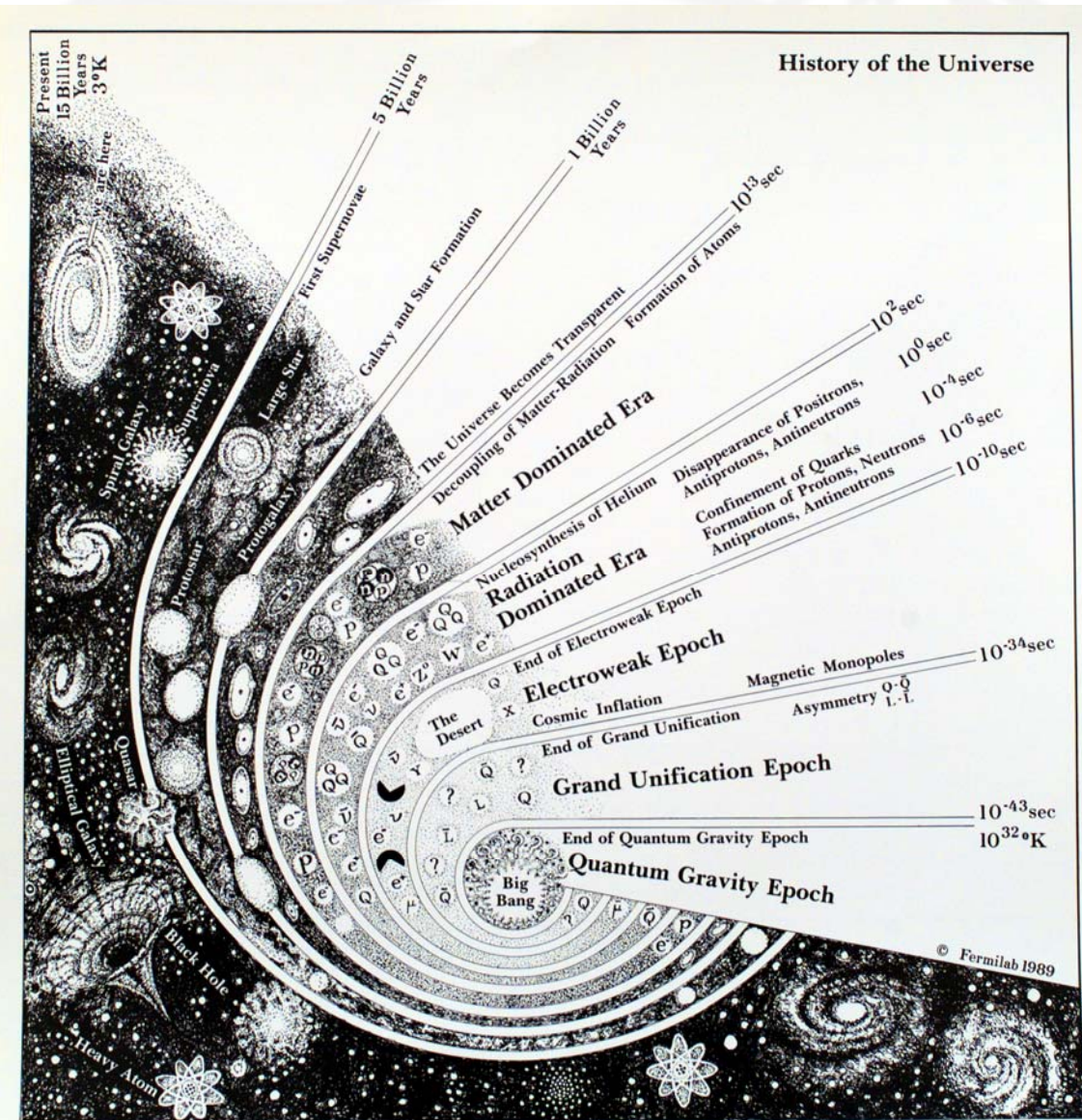


**The “Truly
International Laboratory”**





Inner Space-Outer Space





**...On to
the Future...
the Super
Frontier,
1984-88**

Site Proposal for the

Superconducting Super Collider in

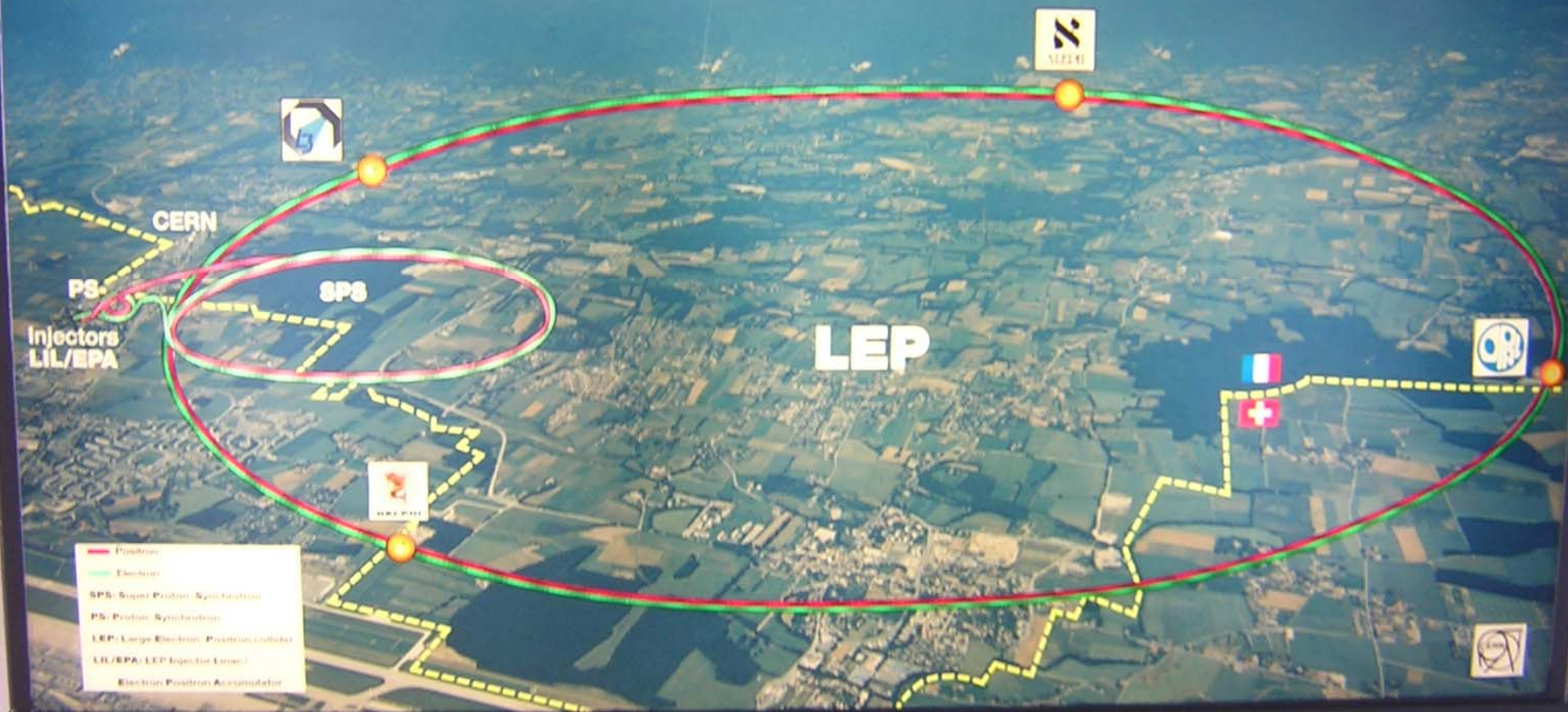
ILLINOIS



Volume 1
Executive Summary



LEP: Large Electron-Positron collider





Computing at Fermilab, 1988





**Feynman
Computing
Center,
1988**





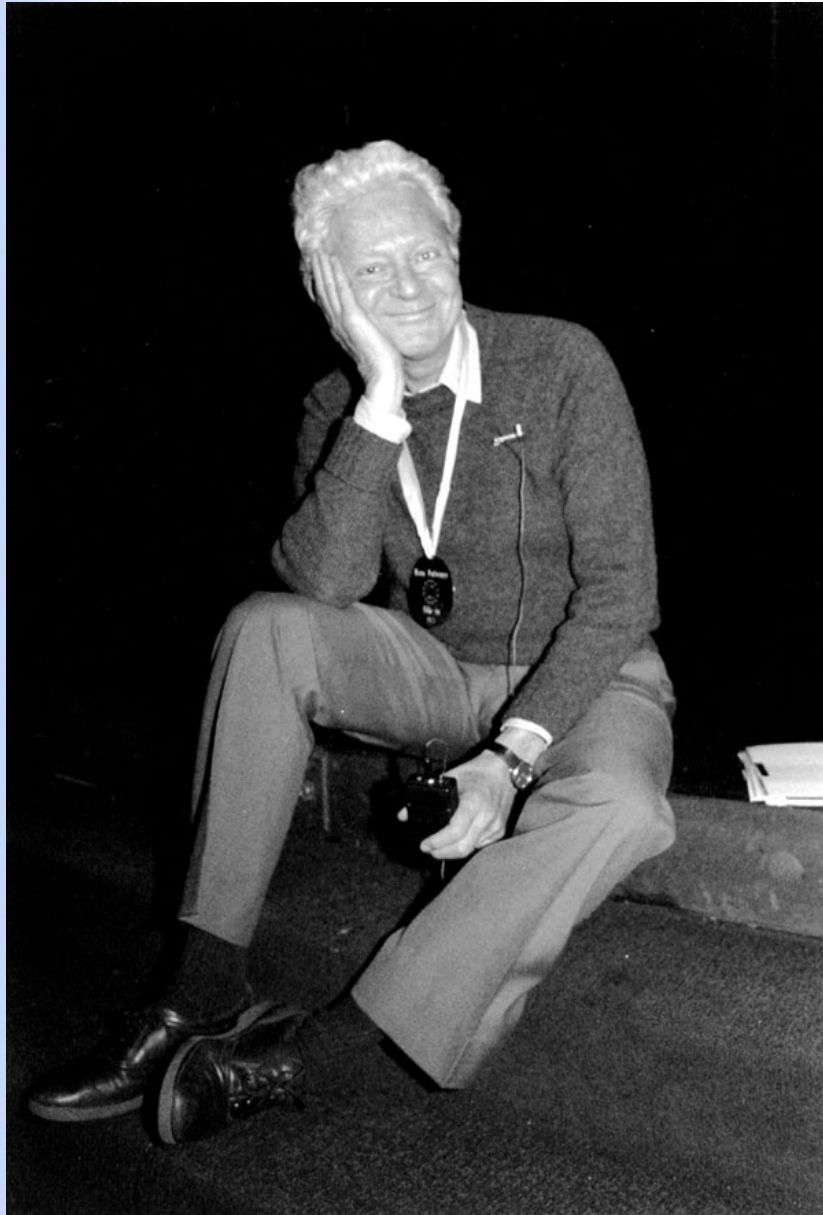
High-Energy Physics - Birthplace of the Web



1990-1992



Director Leon Lederman wins 1988 Nobel Prize





Site Proposal for the

Superconducting Super Collider in

ILLINOIS



Volume 1
Executive Summary



Prairie Restoration Project, 1974





DOE National Environmental Research Park preserving open space in Illinois, 1989





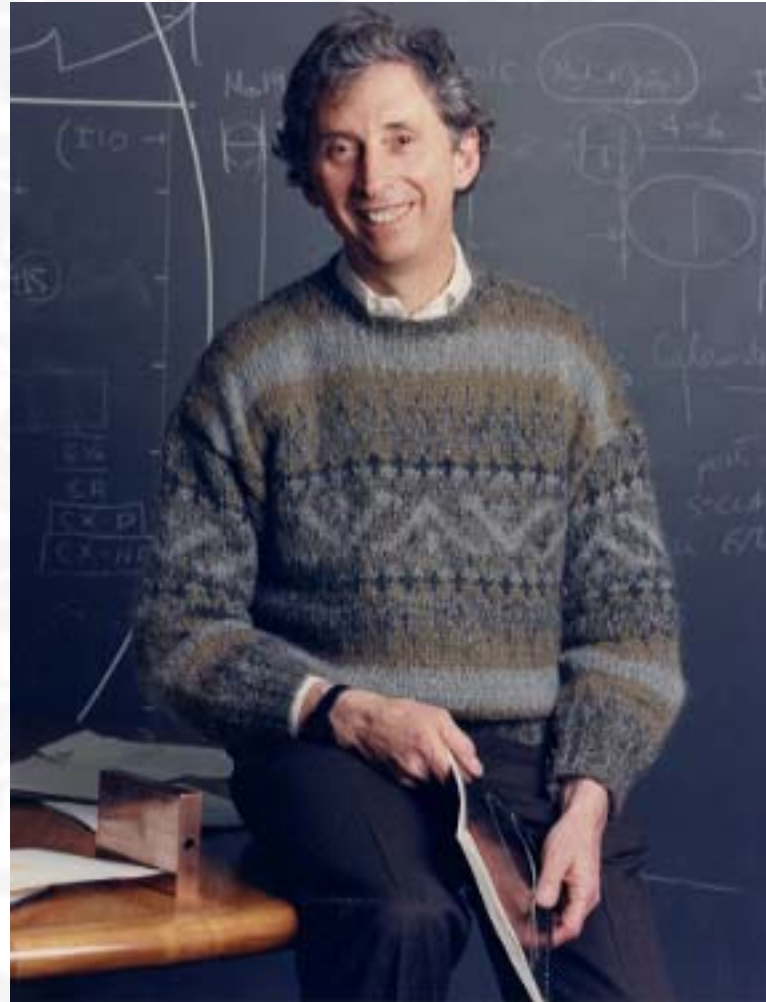
John Peoples and Leon Lederman

April 21, 1989





John Peoples, Jr.
Director
1989-1999





Inner Space

the Main Injector (1993-99)





From the Main Ring (1972)...



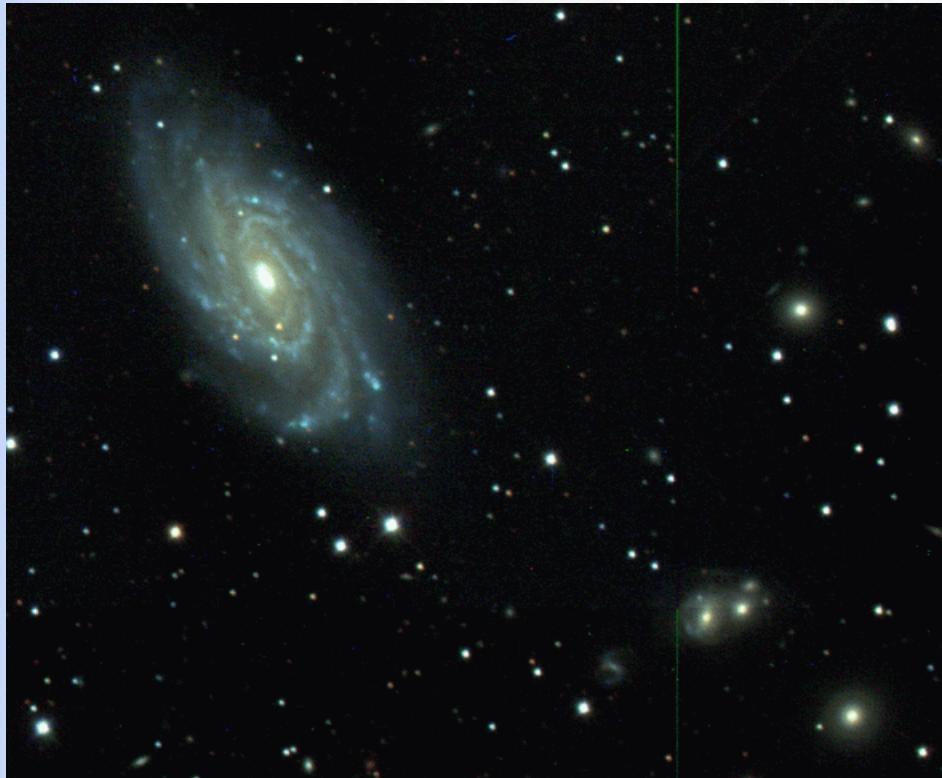


...to the Main Injector (1999)





Outer Space Experimental Astrophysics



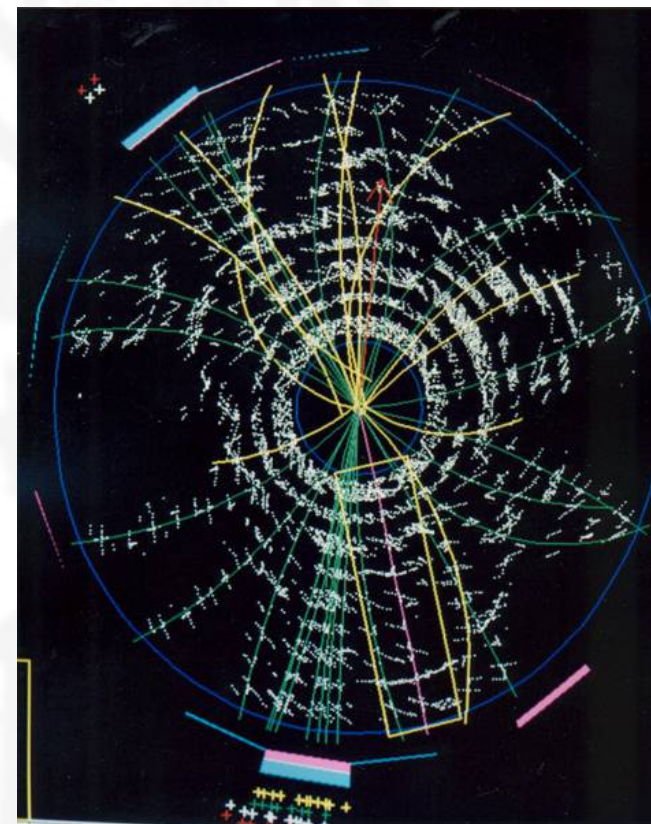
Sloan Digital Sky Survey



Pierre Auger Observatory

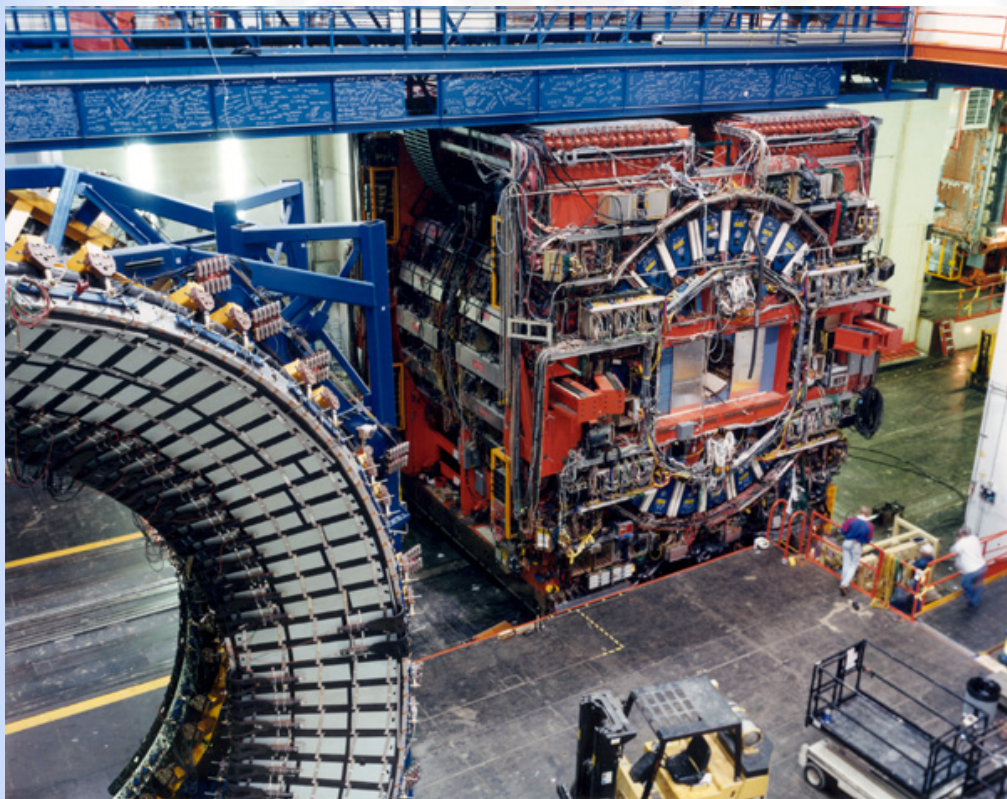


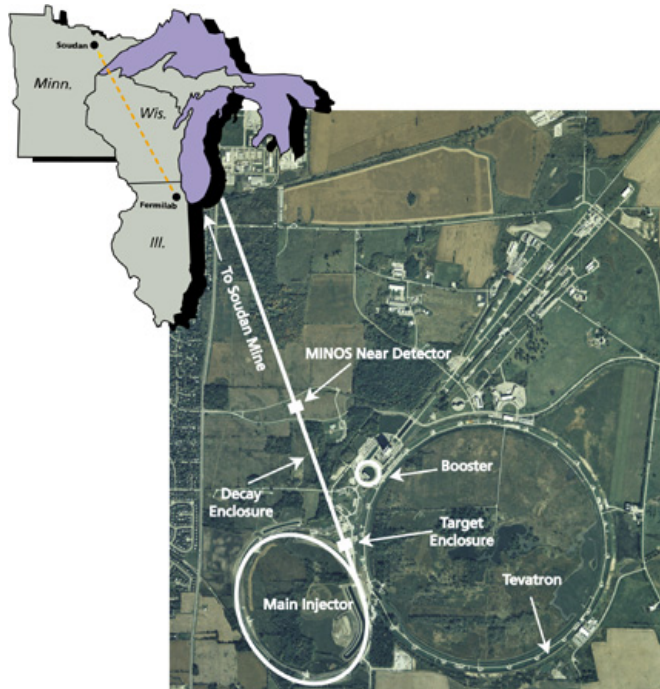
Electronic Data Analysis





CDF and DZero discover Top Quark, 1995





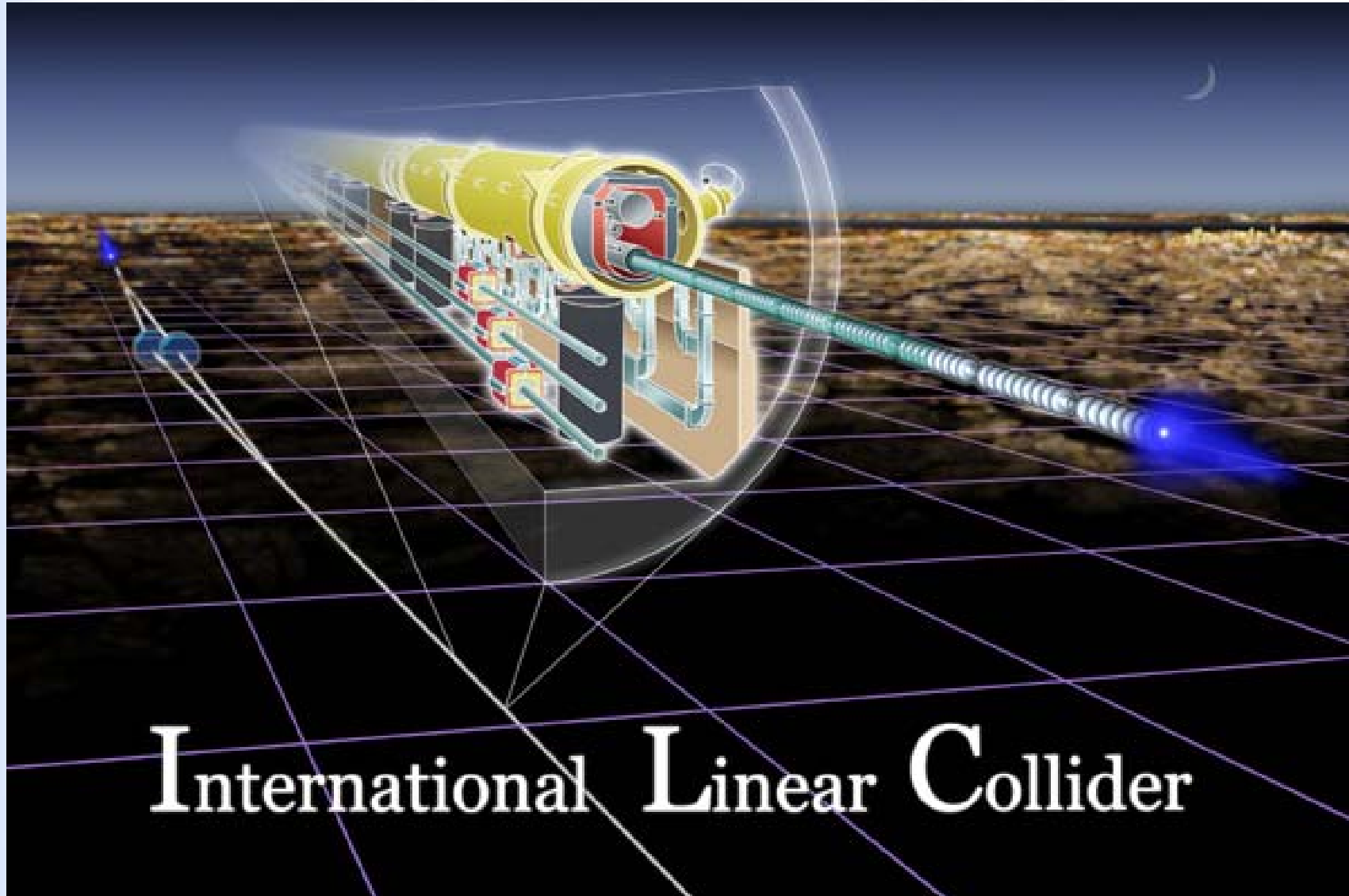
NuMI / MINOS





Michael S. Witherell
Director
1999-2005





International Linear Collider

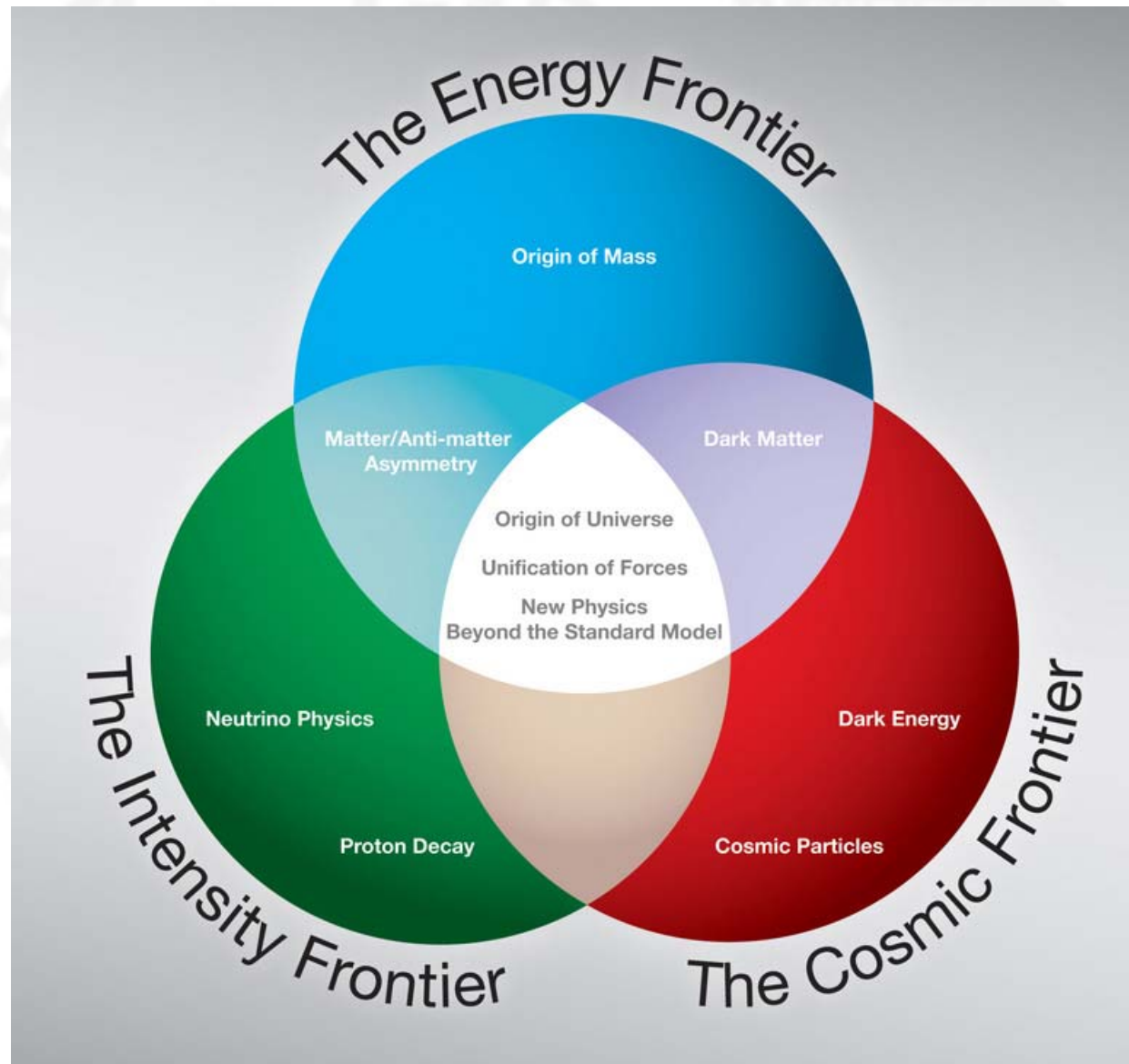


Piermaria J. Oddone
Director
2005-present





Ready for future exploration





Fermilab...still at the frontier





Fermilab

PHYSICS, THE FRONTIER & MEGASCIENCE

Lillian Hoddeson, Adrienne W. Kolb & Catherine Westfall





Fermilab



about Fermilab

home	about Fermilab	contacting Fermilab	inquiring minds	visiting Fermilab	education	search	
for physicists	Fermilab now	events	publications	Fermilab at work	jobs	press pass	help

What is Fermilab?

[what is Fermilab main page](#) | [mission](#) | [history](#) | [Enrico Fermi](#)

History and Archives Project

The History and Archives Project offers guided access into the laboratory's historical

The History and Archives Project
website can be found at

<http://history.fnal.gov/>

- [Announcement of Renaming NAL](#)
- [Dedication of Laboratory](#)
- [Accelerator History](#)
 - [Linac](#)
 - [Booster](#)
 - [Main Ring](#)
 - [Beam Controls](#)
 - [Main Ring transition to Energy Doubler/Saver](#)
- [Fixed Target Program](#)
 - [Internal Target](#)
 - [Meson](#)
 - [Neutrino](#)
 - [Proton](#)
- [Early Computing](#)

